What is Claimed is:

1. A rotary electric machine comprising:

a rotor rotated about a revolving shaft arranged so as to extend in an axial direction thereof;

a bearing holder made of a synthetic resin material and constructed into a hollow structure;

said bearing holder having a forward end positioned on one axial side defined along an axis of said revolving shaft and a rearward end positioned on the other axial side defined along the axis of said revolving shaft and opposite to said one axial side;

said bearing holder being coupled at said rearward end thereof to a casing and having at least one bearing for supporting said revolving shaft fitted therein;

a stator including a stator core, an insulator and a plurality of windings;

said stator core being formed at a central portion thereof with a through-hole via which said bearing holder extends and including a plurality of salient poles arranged on an outer periphery thereof so as to be spaced from each other at predetermined intervals in a peripheral direction of said revolving shaft;

said insulator being made of a synthetic resin material exhibiting electrical insulating properties and arranged so as to cover a part of an outer surface of said stator core while keeping a magnetic pole surface of each of said salient poles of said stator core and an inner surface of said through-hole

exposed;

said windings each being formed by winding a conductive wire on each of said salient poles through said insulator; and

a coupling structure for coupling said bearing holder and insulator to each other to prevent relative movement between said bearing holder and said stator in the axial direction of said revolving shaft and relative movement between said stator and said bearing holder in the peripheral direction of said revolving shaft;

said coupling structure being constituted by:

at least one recess formed on said forward end of said bearing holder projecting through said through-hole of said stator core so as to be open on said one axial side and in a radial direction of said revolving shaft; and

at least one projection provided on said insulator and tightly fitted in said recess of said bearing holder while keeping said bearing holder fully fitted in said through-hole of said stator core.

2. A rotary electric machine as defined in claim 1, wherein said projection of said insulator and said recess of said bearing holder are subjected at a periphery thereof to deformation by heating, to thereby be coupled to each other while keeping said projection fitted in said recess.

3. A rotary electric machine as defined in claim 2, wherein said periphery is subjected to deformation by heating so as to be bent outwardly in a radial direction of said revolving shaft.

4. A rotary electric machine as defined in claim 1, wherein said recesses are arranged on said forward end of said bearing holder while being spaced from each other at substantially equal intervals in the peripheral direction of said revolving shaft; and

said insulator is constituted by two insulator halves respectively fitted on both sides of said stator core defined in said axial direction;

one of said insulator halves which is positioned on said one axial side while keeping said bearing holder fully fitted in said through-hole of said stator including a raised wall extending toward said one axial side from an end surface of said stator core positioned on said one axial side;

said raised wall being integrally formed on an inner surface thereof with said projections in a manner to be spaced from each other at substantially equal intervals in the peripheral direction of said revolving shaft and project in the radial direction of said revolving shaft.

5. A rotary electric machine as defined in claim 4, wherein said raised wall is formed into a substantially cylindrical shape and arranged so as to be concentric with said bearing holder;

said raised wall is formed into an inner diameter which permits said forward end of said bearing holder to be fitted in said raised wall;

said raised wall is integrally provided at a portion thereof positioned rather on said one axial side with said

projections in a manner to project on said one axial side and inwardly in the radial direction of said revolving shaft; and

said bearing holder is subjected at a portion thereof projecting on said one axial side and beyond said raised wall to deformation by heating so as to be bent outwardly in the radial direction of said revolving shaft, resulting in being abutted against a forward end surface of said raised wall.

6. A rotary electric machine as defined in claim 4, wherein said raised wall includes a cylindrical extension extending on said one axial side and beyond said projections.

7. A rotary electric machine as defined in claim 4, wherein said raised wall is formed on the inner surface thereof with slits so as to be positioned between respective adjacent two of said projections and open on said one axial side and in said radial direction.

8. A rotary electric machine as defined in claim 1, wherein said bearing holder and casing are formed so as to be integral with each other.

9. A rotary electric machine comprising:

a rotor rotated about a revolving shaft arranged so as to extend in an axial direction thereof;

a bearing holder made of a synthetic resin material and constructed into a hollow structure;

said bearing holder having a forward end positioned on one axial side defined along an axis of said revolving shaft and a rearward end positioned on the other axial side defined along the axis of said revolving shaft and opposite to said

one axial side;

said bearing holder being coupled at said rearward end thereof to a casing and having at least one bearing for supporting said revolving shaft fitted therein;

a stator including a stator core, an insulator and a plurality of windings;

said stator core being formed at a central portion thereof with a through-hole via which said bearing holder extends and including a plurality of salient poles arranged on an outer periphery thereof so as to be spaced from each other at predetermined intervals in a peripheral direction of said revolving shaft;

said insulator being made of a synthetic resin material exhibiting electrical insulating properties and arranged so as to cover a part of an outer surface of said stator core while keeping a magnetic pole surface of each of said salient poles of said stator core and an inner surface of said through-hole exposed;

said windings each being formed by winding a conductive wire on each of said salient poles through said insulator; and

a coupling structure for coupling said bearing holder and insulator to each other to prevent relative movement between said bearing holder and said stator in the axial direction of said revolving shaft and relative movement between said stator and said bearing holder in the peripheral direction of said revolving shaft;

said coupling structure being constituted by:

at least one recess formed on said forward end of said bearing holder projecting through said through-hole of said stator core so as to be open on said one axial side and in a radial direction of said revolving shaft; and

at least one projection provided on said insulator and press-fitted in said recess of said bearing holder while keeping said bearing holder fully fitted in said through-hole of said stator core.

10. A rotary electric machine as defined in claim 9, wherein said projection of said insulator and said recess of said bearing holder are subjected at a periphery thereof to deformation by heating, to thereby be coupled to each other while keeping said projection fitted in said recess.

11. A rotary electric machine as defined in claim 10, wherein said periphery is subjected to deformation by heating so as to be bent outwardly in a radial direction of said revolving shaft.

12. A rotary electric machine as defined in claim 9, wherein said recesses are arranged on said forward end of said bearing holder while being spaced from each other at substantially equal intervals in the peripheral direction of said revolving shaft; and

said insulator is constituted by two insulator halves respectively fitted on both sides of said stator core defined in said axial direction;

one of said insulator halves which is positioned on said one axial side while keeping said bearing holder fully fitted

in said through-hole of said stator including a raised wall extending toward said one axial side from an end surface of said stator core positioned on said one axial side;

said raised wall being integrally formed on an inner surface thereof with said projections in a manner to be spaced from each other at substantially equal intervals in the peripheral direction of said revolving shaft and project in the radial direction of said revolving shaft.

13. A rotary electric machine as defined in claim 12, wherein said raised wall is formed into a substantially cylindrical shape and arranged so as to be concentric with said bearing holder;

said raised wall is formed into an inner diameter which permits said forward end of said bearing holder to be fitted in said raised wall;

said raised wall is integrally provided at a portion thereof positioned rather on said one axial side with said projections in a manner to project on said one axial side and inwardly in the radial direction of said revolving shaft; and

said bearing holder is subjected at a portion thereof projecting on said one axial side and beyond said raised wall to deformation by heating so as to be bent outwardly in the radial direction of said revolving shaft, resulting in being abutted against a forward end surface of said raised wall.

14. A rotary electric machine as defined in claim 13, wherein said raised wall includes a cylindrical extension extending on said one axial side and beyond said projections.

15. A rotary electric machine as defined in claim 13, wherein said raised wall is formed on the inner surface thereof with slits so as to be positioned between respective adjacent two of said projections and open on said one axial side and in said radial direction.

16. A rotary electric machine as defined in claim 9, wherein said bearing holder and casing are formed so as to be integral with each other.

17. A rotary electric machine comprising:

a rotor rotated about a revolving shaft arranged so as to extend in an axial direction thereof;

a bearing holder made of a synthetic resin material and constructed into a hollow structure;

said bearing holder having a forward end positioned on one axial side defined along an axis of said revolving shaft and a rearward end positioned on the other axial side defined along the axis of said revolving shaft;

said bearing holder being coupled at said rearward end thereof to a casing and having at least one bearing for supporting said revolving shaft fitted therein;

a stator including a stator core, an insulator and a plurality of windings;

said stator core being formed at a central portion thereof with a through-hole via which said bearing holder extends and including a plurality of salient poles arranged on an outer periphery thereof so as to be spaced from each other at predetermined intervals in a peripheral direction of said

revolving shaft;

said insulator being made of a synthetic resin material exhibiting electrical insulating properties and arranged so as to cover a part of an outer surface of said stator core while keeping a magnetic pole surface of each of said salient poles of said stator core and an inner surface of said through-hole exposed;

said windings each being formed by winding a conductive wire on each of said salient poles through said insulator; and

a coupling structure for coupling said bearing holder and insulator to each other to prevent relative movement between said bearing holder and said stator in the axial direction of said revolving shaft and relative movement between said stator and said bearing holder in the peripheral direction of said revolving shaft;

said coupling structure being constituted by:

a plurality of recesses formed on said forward end of said bearing holder projecting through said through-hole of said stator core so as to be open on said one axial side and in a radial direction of said revolving shaft; and

a plurality of projections provided on said insulator and fitted in said recesses of said bearing holder respectively while keeping said bearing holder fitted in said through-hole of said stator core;

a plurality of said projections and a plurality of portions of said forward end positioned between respective adjacent two of a plurality of said recesses of said bearing

holder being subjected to deformation by heating while keeping said projections fitted in said recesses;

said projections and forward end deformed by heating being coupled to each other;

said portions of said forward end being deformed so as to be outwardly bent in a radial direction of said revolving shaft.

18. A rotary electric machine as defined in claim 17, wherein said recesses are arranged on said forward end of said bearing holder while being spaced from each other at substantially equal intervals in the peripheral direction of said revolving shaft; and

said insulator is constituted by two insulator halves respectively fitted on both sides of said stator core defined in said axial direction;

one of said insulator halves which is positioned on said one axial side while keeping said bearing holder fully fitted in said through-hole of said stator including a raised wall extending toward said one axial side from an end surface of said stator core positioned on said one axial side;

said raised wall being integrally formed on an inner surface thereof with said projections in a manner to be spaced from each other at substantially equal intervals in the peripheral direction of said revolving shaft and project in the radial direction of said revolving shaft.

19. A rotary electric machine as defined in claim 18, wherein said raised wall is formed into a substantially

cylindrical shape and arranged so as to be concentric with said bearing holder;

said raised wall is formed into an inner diameter which permits said forward end of said bearing holder to be fitted in said raised wall;

said raised wall is integrally provided at a portion thereof positioned rather on said one axial side with said projections in a manner to project on said one axial side and inwardly in the radial direction of said revolving shaft; and

said bearing holder is subjected at a portion thereof projecting on said one axial side and beyond said raised wall to deformation by heating so as to be bent outwardly in the radial direction of said revolving shaft, resulting in being abutted against a forward end surface of said raised wall.

20. A rotary electric machine as defined in claim 19, wherein said raised wall includes a cylindrical extension extending on said one axial side and beyond said projections.

21. A rotary electric machine as defined in claim 19, wherein said raised wall is formed on the inner surface thereof with slits so as to be positioned between respective adjacent two of said projections and open on said one axial side and in said radial direction.

22. A rotary electric machine as defined in claim 17, wherein said bearing holder and casing are formed so as to be integral with each other.

23. A fan motor comprising:

a rotor rotated about a revolving shaft arranged so as

to extend in an axial direction thereof;

an impeller mounted on said rotor;

a casing made of a synthetic resin material and including a frame having a wind tunnel formed therein in which said impeller is rotated, a motor housing and a plurality of webs for connecting said frame and motor housing to each other;

a bearing holder made of a synthetic resin material by injection molding and constructed into a hollow structure;

said bearing holder having a forward end positioned on one axial side defined along an axis of said revolving shaft and a rearward end positioned on the other axial side defined along the axis of said revolving shaft;

said bearing holder being coupled at said rearward end thereof to said motor housing of said casing and having at least one bearing for supporting said revolving shaft fitted therein;

a stator including a stator core, an insulator and a plurality of windings;

said stator core being formed at a central portion thereof with a through-hole via which said bearing holder extends and including a plurality of salient poles arranged on an outer periphery thereof so as to be spaced from each other at predetermined intervals in a peripheral direction of said revolving shaft;

said insulator being made of a synthetic resin material exhibiting electrical insulating properties and arranged so as to cover a part of an outer surface of said stator core while keeping a magnetic pole surface of each of said salient poles

of said stator core and an inner surface of said through-hole exposed;

said windings each being formed by winding a conductive wire on each of said salient poles through said insulator; and

a coupling structure for coupling said bearing holder and insulator to each other to prevent relative movement between said bearing holder and said stator in the axial direction of said revolving shaft and relative movement between said stator and said bearing holder in the peripheral direction of said revolving shaft;

said coupling structure being constituted by:

a plurality of recesses formed on said forward end of said bearing holder projecting through said through-hole of said stator core so as to be open on said one axial side and in a radial direction of said revolving shaft; and

a plurality of projections provided on said insulator and respectively fitted in said recesses of said bearing holder while keeping said bearing holder fully fitted in said through-hole of said stator core;

said projections and recesses being deformed at a periphery thereof by heating, to thereby be coupled to each other while keeping said projections fitted in said recesses, respectively;

said forward end of said bearing holder being deformed at a portion thereof positioned between each adjacent two of said recesses by heating, to thereby be bent outwardly in the radial direction of said revolving shaft.